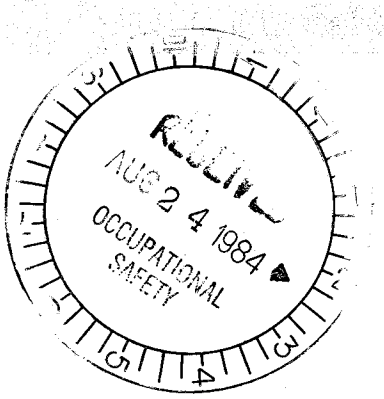

R-922

Description

R-922 is a 350°F curing modified epoxy resin preimpregnated on graphite fabric or unidirectional graphite tape.

Applications

R-922 was developed for use as a structural prepreg in the ever growing field of primary structures. Typical applications include spoilers, ailerons, rudder assemblies, elevators, engine nacelles and various primary helicopter components.

Features

High flow – low viscosity resin

Accelerated straight up cure

Good tack and drape for efficient shop lay-up

Service temperatures up to 350°F including good wet properties up to 270°F

Out time of 15 days at 72°F

Qualified to Boeing Specification BMS 8-212 and Rohr Specification RMS-060

Prepreg Properties

	Graphite Tape*	Graphite Fabric*
Resin Content	37 ± 2%	40 ± 2%
Volatile Content	1% Maximum	1% Maximum
Flow (100 PSI, 350°F)	18 ± 8	22 ± 8
Gel Time (338°F)	19 ± 6 minimum	19 ± 6 minimum
Shelf Life	6 mos @ 0°F or below	6 mos @ 0°F or below
Out Time	15 days @ ambient	15 days @ ambient

*R-922 is available in a wide range of areal fiber weights and a variety of fabric styles. Resin contents may be adjusted to meet specific requirements.

Curing

Apply 22 inches of mercury vacuum (minimum) to vacuum bag in an autoclave. Apply 85 ± 15 psig autoclave pressure, venting the bag to atmosphere when the autoclave pressure reaches 20 psig. Raise part temperature to 355 ± 10 degrees F at a heat up rate of 1-5 degrees F per minute. Hold at 355 ± 10 degrees F for 120 minutes minimum. Cool at a rate of less than 5 degrees F per minute until the part reaches 140 degrees F before releasing pressure.

Mechanical Properties

Table 1

Graphite Tape, 6 mils cpt, per BMS 8-212

Dry Properties	−65	RT	160	270°F
Tensile, ult, 0°, ksi	205	230	245	220
mod, 0°, msi	18.6	18.8	19.2	18.5
strain, 0°, min/in	11000	11000	12000	12000
ult, 90°, ksi	6.0	8.0	5.7	5.3
mod, 90°, msi	1.6	1.3	1.1	1.1
strain, 90°, min/in	3900	6300	5000	5000
ult, 45°, ksi	28.4	30.5	25.2	21.9
Compressive, ult, 0°, ksi	207	208	216	157
mod, 0°, msi	16.9	17.5	17.9	17.6
strain, 0°, min/in	12000	12000	12000	9000
Short beam shear, 0°, ksi	20.4	16.5	15.6	10.6
Wet Properties				
Compressive, ult, 0°, ksi		195	135	69.
Short beam shear, 0°, ksi		15.2	11.6	7.0

Table 2

Graphite fabric, plain weave, 8 mil cpt. per BMS 8-212

Dry Properties (fill direction)	−65	RT	160	270°F
Tensile, ult, ksi	74.7	86.9	93.7	96.3
mod, msi	8.6	8.7	8.6	8.3
strain, min/in	9200	9700	10700	11600
Compression, ult, ksi	81.0	93.1	90.8	68.7
mod, msi	8.4	8.2	8.1	8.3
strain, min/in	9600	11300	11600	8500
Short beam shear, ksi	11.8	10.7	10.7	9.2
Wet Properties				
Compressive, ult, ksi	–	82.0	81.7	49.6

(1) All values calculated using the nominal cured ply thickness.

(2) Wet testing after two weeks in water at 160°F.

Table 3

Exposure Tests

R 922-CGG108 woven graphite prepreg per Rohr RMS 060.

Test	Temp.	As cured	Humidity 95% at 120°F	Skydrol 500B	Jet-A Fuel	MIL-L-23699B Fluid
Flex, ult						
(ksi) mod (msi)	RT	163/10.4	167/10.0	113/9.7	161/9.8	161/9.7
	350	98/9.8	39/6.6	108/9.6	103/9.1	98/9.3
Short beam shear	−67	11.4	9.5	10.4	11.5	11.7
(ksi)	RT	11.4	9.2	11.1	11.8	12.4
	350	7.3	3.3	7.3	6.9	7.0
Tension ult	−67	105/10.3	110/10.8	101/10.1	101/10.3	98/10.4
(ksi) mod (msi)	RT	112/9.5	118/10.7	111/10.3	116/10.1	114/10.1
	350	105/9.5	96/7.9	103/9.6	109/10.3	102/10.6
Compression	−67	124/11.4	116/10.5	111/10.4	117/8.5	114/9.0
ult (ksi)	RT	115/10.8	102/10.6	116/9.1	115/9.0	121/9.1
mod (msi)	350	73/11.9	39/10.7	77/8.8	69/8.8	64/9.0

Fiber volume 62 ± 2%

Packaging	R-922 (woven) is wound on 3-inch cardboard cores interleaved between release paper and polyfilm. The roll is sealed in a polyethylene envelope and packaged in a suitable fiberboard container. R-922 unidirectional tape is wound on 10″ diameter cores with the appropriate interleave.
Storage Recommendations	Store the roll of R-922 in the sealed package at 0°F. Prior to use, allow the package to warm up to room temperature before breaking the seal. this is essential to avoid condensation on the prepreg roll itself. Unused material may be stored for later use provided it is carefully repackaged and sealed.
Safety Precautions	Caution! May cause skin and eye irritation. Prolonged or repeated skin contact may lead to allergic sensitization and dermatitis. Excessive heating or contact with other materials (such as strong oxidizing agents, strong acids or bases) may cause an exothermic reaction and decomposition. Do not handle or use until the Safety Data Sheet has been read and understood. Impervious protective gloves should be worn and the use of an approved barrier cream is recommended. Safety glasses with side shields are also recommended. Avoid contact with eyes, skin or clothing. Avoid inhaling vapors. Store in a cool, dry place and use only with adequate mechanical ventilation and good local exhaust. Wash thoroughly after handling and before eating, drinking or smoking. For industrial use only.
Fire Hazard	In case of fire, the following extinguishers can be used: carbon dioxide, foam, dry chemical or water spray. Self-contained breathing apparatus should be worn since the combustion products will be toxic.
First Aid	**In case of contact** **Skin:** Promptly wash with mild soap and water. Remove contaminated clothing and wash before reuse. **Eyes:** Immediately flush with water for at least 15 minutes. Call a physician. **Inhalation:** Remove to fresh air. Give oxygen if breathing is difficult. **Ingestion:** If conscious, give water to drink and induce vomiting. Call a physician.
Important	Data of this type may be considered to be indicative of representative properties obtainable. CIBA-GEIGY cannot accept responsibility for the misapplication of this product, nor for its use under uncontrolled conditions. Numerical values resulting from the application of this material are dependent on processing details. It is recommended that the user develop application techniques and generate data consistent with specific application and process. **CIBA-GEIGY makes no warranty, whether expressed or implied, including warranties of merchantability or of fitness for a particular purpose.** No statements or recommendations contained herein are to be construed as inducements to infringe any relevant patent, now or hereafter in existence. **Under no circumstances shall CIBA-GEIGY be liable for incidental, consequential or other damages arising out of a claim from alleged negligence, breach of warranty, strict liability or any other theory, through the use or handling of this product.** The sole liability of CIBA-GEIGY for any claims arising out of the manufacture, use or sale of its products shall be for the buyer's purchase price. The above supersedes any provisions in your company's forms, letters and papers.

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